

AMENDMENTS TO THE CLAIMS

1. (Currently amended) A method for producing a water-soluble porous, polymeric material comprising the steps of:

- (a) providing a C/W emulsion comprising an aqueous phase, a matrix building material in the form of a water-soluble polymeric material, a surfactant and a liquid CO₂ phase;
- (b) at least partially freezing the aqueous phase;
- (c) gasifying CO₂ from the liquid CO₂ phase to produce an intermediate porous material;
- (d) venting the gasified CO₂ from the intermediate porous material; and
- (e) freeze drying the intermediate porous material at least substantially to remove the aqueous phase and to form the water-soluble porous material; wherein said water-soluble polymeric material is one or more chosen from the group consisting of water-soluble polysaccharides and water-soluble vinyl polymers, and is substantially free of cross-linking such that said water-soluble porous material is able to substantially fully dissolve in water at 20 °C ~~in less than 107 seconds.~~

2. (Currently amended) A method for producing a porous material as claimed in claim 1, wherein the emulsion further comprises a dopant.

3. (Currently amended) A method for producing a porous material as claimed in claim 2, wherein the dopant is substantially water-soluble.

4. (Currently amended) A method for producing a porous material as claimed in claim 2, wherein the dopant is selected from one or more of the following dopants: pharmaceutical actives, pharmaceutical salts, enzymes, dyes, oxidising agents, reducing agents, cleaning agents, reagents for organic synthesis, agrochemicals, fabric softeners, clothes care agents, bleaches, flavours, fragrances, vitamins or nutraceuticals, metal nanoparticles (e. g., metal hydrosols), inorganic nanoparticles, biological polymers (e. g., DNA, RNA), growth factors/cofactors, and live cells(e. g., stem cells).

5. (Currently amended) A method for producing a porous material as claimed in claim 1, wherein a substantially water-soluble inorganic or organic additive is additionally used.

6. (Currently amended) A method for producing a porous material as claimed in claim 5, wherein the additive is selected from one or more of the following additives: partially hydrolysed silica precursors (i. e., a silica sol), other alkoxide sols, hydroxyapatite salts, and sodium silicate.

7.-9. (Canceled)

10. (Currently amended) A method for producing a porous material as claimed in claim 1, wherein the ~~matrix building~~ water-soluble polymeric material is selected from one or more of the following group of materials: poly(vinyl alcohol)[[,]] and ~~dextran, sodium alginate, poly(aspartic acid), poly(ethylene glycol), poly(ethylene oxide), poly(vinyl pyrrolidone), poly(acrylic acid), poly(acrylic acid)-sodium salt, poly(acrylamide), poly(N-isopropyl acrylamide), poly(hydroxyethyl acrylate), poly(acrylic acid), poly(sodium styrene sulfonate), poly(2-acrylamido-2-methyl-1-propanesulfonic acid), polysaccharides, and cellulose derivatives.~~

11. (Canceled)

12. (Currently amended) A method for producing a porous material as claimed in claim 1, wherein the temperature of the emulsion is reduced to a temperature in the range of -5°C to -30°C.

13. (Currently amended) A method for producing a porous material as claimed in claim 1, wherein the CO₂ is gasified by means of depressurisation of the intermediate porous material.

14. (Currently amended) A method for producing a porous material as claimed in claim 1, wherein the surfactant is selected from one or more of the following list of surfactant: CTAB (cetyltrimethylammonium bromide), SDS (sodium dodecyl sulphate), pluronic surfactants, Brij 30 and Tween 40.

15. (Currently amended) A method for producing a porous material as claimed in claim 1, wherein the matrix building material is contained within the aqueous phase of the emulsion.

16. (Currently amended) A method for producing a porous material as claimed in claim 1, wherein the constituents of the emulsion are in the following quantities: the matrix building

material is in the range of 5-20 % w/v and the surfactant is in the range of 5-20 % w/v in respect of H₂O and the CO₂ is in the range of 65-95 % v/v.

17. (Currently amended) A method for producing a porous material as claimed in claim 1, wherein the porous material is produced in the form of a monolithic block.

18. (Currently amended) A method for producing a porous material as claimed in claim 1, wherein the porous material is produced in the form of porous particles or beads.

19. (Currently amended) A method for producing a porous material as claimed in claim 1, wherein the emulsion further comprises an active ingredient for incorporation into the porous material.

20. (Currently amended) A method for producing a porous material as claimed in claim 19, wherein the active ingredient is selected from one or more from the following group; pharmaceutical actives, pharmaceutical salts, enzymes, dyes, oxidising agents, reducing agents, cleaning agents, reagents for organic synthesis, agrochemicals, fabric softeners, clothes care agents, bleaches, flavours, fragrances, vitamins or nutraceuticals, metal nanoparticles (e. g., metal hydrosols), inorganic nanoparticles, biological polymers (e. g., DNA, RNA), growth factors/cofactors, and live cells (e. g., stem cells).

21.-22. (Canceled)

23. (Currently amended) A water-soluble porous material obtained by the method according to claim 1, wherein the material is characterised by having

- (a) a median pore diameter within the range of 5-100 microns;
- (b) a total pore volume in the range of 8-15 cm³/g when approximately 80%v/v CO₂ is used; and
- (c) a bulk density typically in the range 0.02-0.06 g/cm³, and being able to substantially fully dissolve in water at 20 °C ~~in less than 107 seconds~~.

24. (Previously presented) A water-soluble porous material according to claim 23, characterised by having substantially no solvent residue remaining in the material that arises from the internal template phase.

25. (Previously presented) A water-soluble porous material according to claim 23, being produced in the form of a moulded, monolithic block that substantially conforms to the shape of a vessel in which it is produced.

26. (Currently amended) A water-soluble porous material comprising a water-soluble polymeric matrix, said water-soluble polymeric material being one or more chosen from the group consisting of water-soluble polysaccharides and water-soluble vinyl polymers, which matrix comprises substantially no residual organic solvent, said porous material being able to substantially fully dissolve in water at 20 °C ~~in less than 107 seconds~~.

27. (Currently amended) A water-soluble porous material according to claim 26 obtainable by a method which utilises substantially no organic solvent, hence the matrix being substantially free from any residual organic solvent component.

28. (Currently amended) A water-soluble porous material according to claim 26 comprising surfactant moieties entangled with the polymeric matrix.

29. (Currently amended) A water-soluble porous material according to claim 28, wherein the presence of surfactant moieties results from the formation of the porous material from a C/W emulsion comprising the surfactant moieties.

30. (Currently amended) A water-soluble porous material as claimed in claim 26, wherein the material is used for one or more of the following applications: biomaterials, food materials, DNA storage, controlled release matrices, agrochemical release, reagent release (e. g., for chemical reactions), molecular separations and diagnostic reagent release.